

REMARKS

By this amendment, Applicants have added new claims 31-32. As a result, claims 20-32 are pending in this application. Reconsideration in view of the following remarks is respectfully requested.

In the Office Action, claims 22, 23, 26, and 27 are objected to as being dependent upon a rejected base claim. Applicants thank the Examiner for the indication of allowable subject matter in these claims.

Further, the Office rejects claims 20 and 21 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,523,589 (Edmond) in view of U.S. Patent No. 6,563,141 (Dawson). In order to establish a *prima facie* case of obviousness, the Office must show that (1) every feature is taught or suggested by Edmond and/or Dawson; (2) Edmond, Dawson, or generally available knowledge suggests or motivates the modification(s); and (3) one would have a reasonable expectation of success. MPEP 2143. Because the Office fails to establish a *prima facie* case of obviousness, Applicants respectfully request withdrawal of the rejections of claims 20 and 21.

For example, the Office fails to show that every feature of the claimed invention is taught or suggested by Edmond and/or Dawson. In particular, the Office acknowledges that Edmond fails to teach or suggest the required quaternary layer. However, the Office cites Dawson as allegedly teaching a “multilevel quaternary layer 15 [that] is InAlGaN” similar to the claimed invention. Initially, Applicants note that Dawson refers to a “multilayer structure 15”. To this extent, structure 15 includes a plurality of layers (i.e., layers 16, 18, 20) and is not similar to Applicants’ claimed quaternary layer.

Further, Dawson fails to teach that the structure, or any of the corresponding layers, could comprise a quaternary layer. The Office fails to cite a particular portion of Dawson in support of its conclusion. Applicants note that Dawson only discusses layer 16 as comprising GaN (col. 5, lines 47-49), layer 18 as comprising an InGaN/GaN/AlGaN active region (col. 5, line 63-col. 6, line 5), and layer 20 as comprising GaN (col. 6, lines 6-7). To this extent, no portion of structure 15 comprises a quaternary layer as alleged by the Office. Further, layer 16, which is the bottom-most layer of structure 15, comprises a binary GaN layer, not the claimed quaternary layer that includes Ga, Al, N, and In.

Dawson does teach that the structure can be "based on the InAlGaN quaternary system". Col. 1, lines 6-7 and 58-63. Applicants note that such a system merely means that the content of each layer in the structure can include one or more of the four elements: In, Al, Ga, and N. As discussed above, such a system fails to disclose Applicants' claimed quaternary layer. However, should the Office maintain this interpretation of Dawson, Applicants respectfully request that the Office particularly point out that portion of Edmond that allegedly teaches that any layer in structure 15 can comprise a quaternary layer.

In light of the above, even if, *arguendo*, the combination of Edmond and Dawson is proper, such a combination fails to disclose each and every feature of the claimed invention. As a result, Applicants respectfully request withdrawal of the rejection of claims 20 and 21 as allegedly being unpatentable over the combination of Edmond and Dawson.

Additionally, the Office fails to show any proper motivation in Edmond, Dawson or the generally available knowledge for the proposed combination. As the Federal Circuit discussed extensively in *In re Lee*, 277 F.3d 1338; 61 U.S.P.Q.2D (BNA) 1430 (Fed. Cir. 2002), "[w]hen

patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness." Citing *In re Dance*, 160 F.3d 1339, 1343, 48 U.S.P.Q.2D (BNA) 1635, 1637 (Fed. Cir. 1998), the *Lee* Court goes on to state that "there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant". *Id.*

The need to show the motivation with specificity has long been recognized by the courts. *Id.* For example, the *Lee* Court cites *In re Kotzab* for the legal requirement that "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed". *Id.*; *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2D (BNA) 1313, 1317 (Fed. Cir. 2000). Further, the *Lee* Court cites *In re Rouffet* for the legal requirement that a proper showing of motivation, "even when the level of skill in the art is high; ... must identify specifically the principle, known to one of ordinary skill, that suggests the claimed invention." *Id.*; *In re Rouffet*, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998).

In the Office Action, the Office states that such motivation would be to "have a semiconductor device with increased performance." (Page 3 of current Office Action). However, the Office fails to cite any such teaching in Dawson, Edmond, or the generally available knowledge. Clearly, if Dawson, Edmond, or the generally available knowledge anticipates such a result from the proposed combination, the prior art would have expressly taught the proposed modification. To this extent, the Office's motivation constitutes a

conclusory statement, improperly made with the benefit of the hindsight of Applicants' claimed invention.

Under *In re Lee* and the related decisions, such a conclusory statement clearly fails to provide the necessary specificity to show the required teaching, suggestion or motivation for the specific combination proposed by the Office. In particular, a desired result (i.e., "device with increased performance") does not constitute a specific finding or principle that supports the Office's selection and/or combination of the components from Dawson or Edmond to obtain the desired result. To this extent, the Office has failed to show a proper motivation for the specific combination used by the Office. As a result, Applicants respectfully request withdrawal of the rejection of claims 20 and 21 as allegedly being unpatentable over the combination of Edmond and Dawson.

Additionally, Applicants note that while Edmond and Dawson both teach optical devices, such devices operate in a substantially different manner and are not combinable. For example, Edmond comprises a light emitting diode that includes a conductive silicon carbide substrate. Abstract. Use of the conductive silicon carbide substrate enables an ohmic contact to be made to the substrate, a key feature of the Edmond device. Col. 5, lines 9-12. As discussed in Edmond, use of a nonconductive substrate, such as sapphire prevents the formation of a device configured similarly to Edmond. Col. 5, lines 12-17.

In sharp contrast, Dawson provides a device having a sapphire substrate. See, e.g., col. 5, lines 8-11. As expressly stated in Edmond, such a substrate cannot be used in the device of Edmond. Col. 5, lines 12-17. Further, Dawson's device includes a mirror 14 that deflects photons to exit the diode through the top surface. See, e.g., col. 4, lines 36-39. Such a

configuration would clearly be undesirable in Edmond, which comprises a vertical geometry. To this extent, Applicants respectfully submit that Edmond and Dawson cannot be properly combined since the operational characteristics of the devices, and therefore the corresponding layers included in each device, differ substantially (see, e.g., Edmond, Col. 6, lines 13-15). That is, Dawson teaches a device that requires a nonconductive substrate (i.e., sapphire) and includes a mirror, while Edmond teaches a device that requires a conductive substrate (i.e., conductive silicon carbide) for its vertical geometry.

In view of each of the reasons stated above, either alone or in combination, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness. As a result, Applicant respectfully requests withdrawal of the rejection of claims 20 and 21 as allegedly being unpatentable over the combination of Edmond and Dawson.

Further, the Office rejects claims 24-25 and 28-30 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Edmond in view of Dawson further in view of Japanese Patent No. 11-243251 (Sasanuma). With respect to claims 24 and 29, Applicants note that the Office relies on the same interpretation of Edmond, Dawson, and the combination of Edmond and Dawson as discussed above with reference to claim 20. To this extent, Applicants herein incorporate the arguments presented above with respect to claim 20. Additionally, the Office fails to provide any motivation for the modification of Edmond with Dawson and Sasanuma for the same reasons presented above with respect to the combination of Edmond and Dawson.

Additionally, even if, *arguendo*, the Office's combination of Edmond, Dawson, and Sasanuma is proper, Applicants submit that the Office fails to show that the combination teaches every feature of the claimed invention. For example, with respect to claim 24, the Office

acknowledges that neither Edmond or Dawson teaches or suggests the claimed second layer that includes AlGaN and quaternary layer that includes AlInGaN on the second layer. However, the Office cites Fig. 6 of Sasanuma as allegedly teaching these features. Applicant notes that the English language portion of Sasanuma provided by the Office, which references Fig. 1 of Sasanuma rather than Fig. 6 as apparently alleged by the Office, discloses an InGaN/InAlGaN layer combination, not the claimed second layer that includes AlGaN and quaternary layer that includes AlInGaN on the second layer. In Fig. 6 of Sasanuma, the various layer combinations comprise InGaN/AlGaN layer combinations, which are also different from the claimed second layer that includes AlGaN and quaternary layer that includes AlInGaN on the second layer.

In view of each of the reasons stated above, either alone or in combination, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness. As a result, Applicant respectfully requests withdrawal of the rejection of claim 24 and claims 25 and 28, which depend therefrom, and claim 29 and claim 30, which depends therefrom, as allegedly being unpatentable over Edmond in view of Dawson further in view of Sasanuma.

Applicants submit that newly added claims 31-32 are allowable as presented, and that each of the pending claims is patentable for one or more additional unique features. To this extent, Applicants do not acquiesce to the Office's interpretation of the claimed subject matter or the references used in rejecting the claimed subject matter. Additionally, Applicants do not acquiesce to the Office's combinations and modifications of the various references or the motives cited for such combinations and modifications that were not specifically addressed herein. These features and the appropriateness of the Office's combinations and modifications have not been

separately addressed herein for brevity. However, Applicants reserve the right to present such arguments in a later response should one be necessary.

In light of the above, Applicants respectfully submit that all claims are in condition for allowance. Should the Examiner require anything further to place the application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the number listed below.

Respectfully submitted,



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